IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
TO THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re Application of	:	Elmar KIBLER et al.
Serial No.	:	10/522,157
For	:	SYNERGISTICALLY ACTING HERBICIDAL MIXTURES
Filed	:	January 24, 2005
TC/A.U.	:	1616
Examiner	:	Courtney Brown
Docket No.	:	3165-116
Customer No.	:	6449
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Commissioner for Patents
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August 18, 2009

APPELLANT'S APPEAL BRIEF UNDER 37 C.F.R. §41.37

Sir:

The following comprises the Patent Owner's Brief on Appeal from the Office Action dated December 19, 2008, in which claims 1, 8, 9, 23 and 26-33, were finally rejected. A Notice of Appeal was filed on June 18, 2009. This Appeal Brief is accompanied by the required Appeal fee set forth in 37 C.F.R. § 41.20(b)(2), and is being timely filed on August 18, 2009.

I.

REAL PARTY IN INTEREST

The owner of the above-referenced patent and the real party in interest in this appeal is BASF Aktiengesellschaft, 67056 Ludwigshafen, Germany.

II.

RELATED APPEALS AND INTERFERENCES

The Patent Owner is unaware of any other appeals or interferences related to the subject matter of this appeal.

III.
STATUS OF CLAIMS

The rejection of claims 1, 8, 9, 23 and 26-33, all of the claims under consideration in the present application, is being appealed. Claims 1 and 31 the only independent claims with claims 8, 9, 23, 26-30 and 32-33 depending directly or indirectly from claim 1 or claim 31. No claims are allowed. The appealed claims are reproduced in the Appendix attached hereto.

Claims 2-7, 10-22, and 24-25 were previously canceled.

IV.
STATUS OF AMENDMENTS

No claim amendments were made in the response to the final rejections which was filed on April 20, 2009. This appeal is based on the claims as amended in the response to the non-final rejections filed on November 20, 2008.

V.
SUMMARY OF THE CLAIMED SUBJECT MATTER

In crop protection products, it is desirable to increase the specific activity of an active ingredient and the reliability of its action. The presently claimed invention

increases the activity and/or selectivity of the herbicidally active compound 4-[2-methyl-3-(4,5-dihydroisoxazol-3-yl)-4-methylsulfonyl-benzoyl]-1-methyl-5-hydroxy-1H-pyrazole against undesirable harmful plants (page 2, lines 31-36). The present inventors have found that specific mixtures of compounds increase the activity and/or selectivity of 4-[2-methyl-3-(4,5-dihydroisoxazol-3-yl)-4-methylsulfonyl-benzoyl]-1-methyl-5-hydroxy-1H-pyrazole and have prepared herbicidal compositions which comprise these mixtures, determined processes for their preparation, and determined methods of controlling undesirable vegetation. The present inventors have also found that it is irrelevant whether the herbicidally active compounds of the components A), B) and C) are formulated and applied jointly or separately and in which sequence they are applied in the case of separate application (page 3, lines 1-7). The mixtures according to the presently claimed invention show a synergistic effect and the compatibility of the herbicidally active compounds of components A), B) and C) for certain crop plants is generally retained (page 3, lines 9-12).

Independent claim 1 is directed to a synergistic herbicidal mixture comprising 4-[2-methyl-3-(4,5-dihydroisoxazol-3-yl)-4-methylsulfonyl-benzoyl]-1-methyl-5-hydroxy-1H-pyrazole (page 19, lines 6-8) and two herbicides selected from the group consisting of imazapyr, imazaquin, imazamethabenz-methyl, imazamox, imazapic and imazethapyr (page 19, lines 16-20); and a triazine (page 24, lines 23-27) selected from the group consisting of ametryn, atrazine, cyanazine, desmetryn, dimethamethryn, prometon, prometryn, propazine, simazine, simetryn, terbumeton, terbutryn,

terbutylazine and trietazine (page 7, lines 8-11) or their environmentally compatible salts (page 8, line 9); in a synergistically effective amount (page 2, line 20).

Independent claim 31 is directed to a method of controlling undesired vegetation (page 2, lines 27-29), comprising applying simultaneously or separately to said vegetation (page 3, lines 2-7), the environment of said vegetation and/or seeds of said vegetation (page 28, lines 11-13), 4-[2-methyl-3-(4,5-dihydroisoxazol-3-yl)-4-methylsulfonyl-benzoyl]-1-methyl-5-hydroxy-1H-pyrazole (page 19, lines 6-8), two herbicides selected from the group consisting of imazapyr, imazaquin, imazamethabenz-methyl, imazamox, imazapic and imazethapyr (page 19, lines 16-20) and a triazine (page 24, lines 23-27) selected from the group consisting of ametryn, atrazine, cyanazine, desmetryn, dimethamethryn, prometon, prometryn, propazine, simazine, simetryn, terbumeton, terbutryn, terbutylazine and trietazine (page 7, lines 8-11) , or their environmentally compatible salts (page 8, line 9); in a synergistically effective amount (page 2, line 20).

Claims 8, 9, 23, 26-30 and 32-33 depend directly or indirectly from claim 1 or claim 31.

VI.
GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

The only issue on appeal is whether the invention claimed in claims 1, 8, 9, 23 and 26-33 can reasonably be found obvious under 35 USC §103(a) over Sievernich et al. (CA 2,334,955).

VII.

ARGUMENTS

Claims 1, 8, 9, 23 and 26-33 are not obvious under 35 USC §103(a) over Sievernich et al. (CA 2,334,955) because claims 1, 8, 9, 23 and 26-33 recite subject matter not shown or suggested by the cited prior art.

Applicants respectfully point out that Sievernich et al. discloses a synergistic binary mixture, comprising as component A) 4[2-methyl-3-(4,5-dihydroisoxazol-3-yl)-4-methylsulfonyl- benzoyl]-1-methyl-5- hydroxy-1H-pyrazole and as component B) inter alia imidazolinone compounds (in group B2) or triazines (in group B12). Applicants point out that imidazolinones and triazines are alternatives in Sievernich's binary mixture, not third and/or fourth components of the mixture. As a specific embodiment, Sievernich describes synergistic ternary mixtures, comprising as component A) 4-[2-methyl-3-(4,5-dihydroisoxazol-3-yl)-4-methylsulfonyl- benzoyl]-1-methyl-5- hydroxy-1 H-pyrazole and as component B) two herbicidal compounds from groups B1 to B16 (page 34, line 43, and claim 25).

syn. mix.	CA 2,334,955		US10/522,157
A +	4-[2-methyl-3-(4,5-dihydroisoxazol-3-yl)-4-methylsulfonyl- benzoyl]-1-methyl-5-hydroxy-1H-pyrazole		4-[2-methyl-3-(4,5-dihydroisoxazol-3-yl)-4-methylsulfonyl- benzoyl]-1-methyl-5-hydroxy-1H-pyrazole
B +	**imidazolinone** (B2) such as **imazapyr***, imazaquin, imazamethabenz, imazamoc, imazapic imazethapyr, imazamethapyr;	**triazine** (B12) such as ametryn, **atrazine***, cyanazine, desmetryn, dimethamethryn, prometon, prometryn, propazine, simazine, terbumeton, terbutryn, terbutylazine, trietazine;	**at least two imidazolinones**, selected from imazapyr, imazaquin, imazethabenz-methyl, imazamox, imazapic, imazethapyr;
C	**OPTIONALLY:** a herbicidal compound from amongst the groups **B12** and **B14** (page 35, lines 4 to 8, claim 26;		triazine (*atrazine*)

*: exemplified

Dependent claim 25 according to Sievernich et al. describes a particular embodiment of the general inventive idea of synergistic binary mixtures comprising 4-[2-methyl-3-(4,5-dihydroisoxazol-3-yl)-4 methylsulfonyl-benzoyl]-1-methyl-5-hydroxy-1H-pyrazole as component A). The third component in this claim is not required to contribute to the synergistic effect of the binary mixture (i.e. there is no suggestion that the third component can be selected to increase the synergistic effect produced by the two main components).

In further a specific embodiment, Sievernich et al. describes synergistic ternary mixtures comprising as component A) 4-[2-methyl-3-(4,5-dihydroisoxazol-3-yl)-4-methylsulfonyl- benzoyl]-1-methyl-5- hydroxy-1H-pyrazole, as component B) a herbicidal compound from groups B1 to B16 and as a third component (which can be

called C to allow for easier comparison with the present application) a herbicidal compound selected from among the groups B12 and B14. Experimental support is given in tables 76 (nicosulfuron (B2) and dicamba (B14)), tables 77 and 78 (diflufenzopyr (B5) and dicamba (B14)), table 79 (dimethenamide (B9) and atrazine (B12)), table 80 (bentazone (B12) and atrazine (312)), tables 81 and 82 (atrazine (B12) and dicamba (B14)). Again, there is no suggestion that the third component contributes to the synergistic effect of the binary mixture. The ternary mixtures described by Sievernich et al. are specific embodiments of the synergistic binary mixtures (i.e. the binary mixture accounts for the synergistic effect)

Applicants point out that there are several significant differences between Sievernich et. al. and the present invention:

- Sievernich et al. does not teach herbicidal mixtures comprising two imidazolinone compounds. The only specific disclosure of a mixture comprising an imidazolinone compound is in Tables 11 and 12 which disclose as component A) 4-[2-methyl-3-(4,5- dihydroisoxazol-3-yl)-4-methylsulfonyl- benzoyl]-1-methyl-6-hydroxy-1H-pyrazole and as component B) an imidazolinone compound, i.e. imazapyr. Unlike the present invention, Sievernich et al. does not specifically disclose the use of two imidazolinone compounds.
- Specific mixtures with other imidazolinone compounds (shown in tables 13-16) comprise as component A) compound Ia.3, which differs from component A) of the present invention in that it features a chlorine-residue in the R^1 position. Ia.33 (component A) of the present invention features a methyl-residue in the respective

position. Thus, tables 13-16 cannot be used to reasonably predict the synergistic effect achieved using the present invention.

- Sievernich et al. discloses ternary mixtures comprising two components B) only in generic terms with no specific examples. Sievernich et al. describes binary mixtures comprising as component B) imidazolinone compounds, indicating mixtures with individual compounds only. There is no suggestion to add a second imidazolinone compound to these synergistic mixtures or that the addition of a second imidazolinone will lead to a composition with increased synergistic activity.
- No ternary mixtures disclosed by Sievernich (table 76) et al. comprise an imidazolinone compound.
- Sievernich et al. does not suggest or disclose quaternary mixtures at all.

The subject matter of the present invention could be viewed as a selection invention. While Sievernich et al. teach binary mixtures comprising as component A) 4-[2-methy1-3-(4,5- dihydroisoxazol-3-yl)-4-methylsulfonyl- benzoyl]-1-methyl-5-hydroxy-1H-pyrazole and as component B) inter alia an imidazolinone compound, the mixtures according to the present invention comprise four strictly defined individual herbicides. The inventive step of the Sievernich application is substantiated by the unexpected synergistic effect of the binary mixture comprising as component A) 4[2-methyl-3-(4,5-dihyclroisoxazol-3-yl)-4-methylsulfonyl- benzoyl]-1-methyl-5-hydroxy-1H-pyrazole and inter alia as component B) imazapyr (tables 11 and 12). The examiner contends that adding a third and fourth herbicide to a synergistic mixture would be obvious to one skilled in the art with the expectation of obtaining a synergistic mixture

with enhanced effectiveness. Synergistic effects are not predictable but depend on the selected compounds or class of compounds. Even a purely additive effect cannot always be predicted based on calculations. Furthermore, the Examiner overlooks the fact that the addition of the fourth component in the present invention, the triazine, not only provides for enhanced effectiveness, i.e. an additive effect, but for an additional synergistic effect which could not have been predicted from the disclosure in Sievernich et al. The fact that the effectiveness of an already highly active herbicidal mixture can yet again be boosted in a more than additive effect is totally unexpected and unpredictable. Applicants point out that the higher the level of control of unwanted vegetation already achieved, the more difficult it is to produce a further improvement by addition of another active ingredient, much less a further synergistic effect.

In the present application, Tables 7 and 8 indicate the herbicidal activity for the individual components A), B) and C) and Tables 10-17 show the synergistic effect of the fourth component on top of the activity of the three other components. This data clearly confirms that the addition of a triazine (fourth component) to a mixture comprising as component A) 4-[2-methyl-3-(4,5-dihydroisoxazol-3-y1)-4-methylsulfonyl- benzoyl]-1-methyl-5-hydroxy-1H-pyrazole and as component B) at least two imidazolinone compounds, results in a synergistic effect. This effect is different and independent from the synergistic effect which is achieved from combining only component A) 4-[2-methyl-3-(4,5- dihydroisoxazol-3-yl-4-methylsulfonyl- benzoyl]-1-methyl-5-hydroxy-1 H-pyrazole and as component B) an imidazolinone compound as disclosed in Sievernich et al. In comparing the synergistic activity of the presently

claimed invention, the Colby-value, which stands for the calculated additive effect [%], has to be compared to the observed effect (damage [%]). E is the value which would be expected if the combination of active ingredients produces only an additive effect. This value is compared to the actual result (Damage [%]) to determine if a synergistic effect is produced. If E is less than the Damage [%], then synergy is occurring. Therefore the combination of the individual components produces a synergistic effect. The Colby value is a prediction of the results of combining individual active ingredients which is why there is no Colby value for the individual components. This data demonstrates that the claimed inventive mixtures result in more than a simply additive effect. These results are unpredictable and non-obvious in view of Sievernich et al. One of skill in the art could not have guessed or known which of the numerous possible combinations from Sievernich would show synergistic activity without detrimental effects. The subject matter of the present invention is a strictly defined quaternary mixture. There is no indication in Sievernich et al. how to select the specific components of the presently claimed invention. In addition, a second more than additive, i.e. synergistic increase in herbicidal activity, could not have been predicted as synergistic effects in general cannot be predicted. Synergy has been demonstrated in the present application for a fair number of representative embodiments encompassed by the present invention. Applicants contend that one skilled in the art would not add a third and fourth component to a binary mixture with the expectation of obtaining a synergistic mixture with enhanced effectiveness. This may or may not be the case, depending on the selected compounds. Even a purely

additive effect does not always occur just because it can be calculated. The Examiner overlooks the fact that the addition of the third and fourth components, provides not only enhanced effectiveness, i.e. an additive effect, but provides a second, additional synergistic effect which has been confirmed by experimental evidence and would not have been predictable or obvious over Sievernich. The fact that the effectiveness of an already highly active herbicidal mixture can yet again be boosted in a more than additive manner is totally unexpected. It must be noted that the higher the level of control of unwanted vegetation already achieved, the more difficult it is to produce further improvement by addition of a further active ingredient, much less a further synergistic effect.

In view of the fact that Sievernich does not suggest or disclose the specific quaternary mixture recited in the present claims or describe or suggest a second synergistic effect which boosts the already present synergistic effect between the two main active ingredients, applicants contend that this rejection should be withdrawn.

Conclusion

For all of the above noted reasons, it is strongly contended that certain clear differences exist between the present invention as claimed in claims 1, 8, 9, 23 and 26-32 and the prior art relied upon by the Examiner. It is further contended that these differences are more than sufficient evidence that the present invention would not have

been obvious to a person having ordinary skill in the art at the time the invention was made.

This final rejection being in error, therefore, it is respectfully requested that this honorable Board of Patent Appeals and Interferences reverse the Examiner's decision in this case and indicate the allowability of claims 1, 8, 9, 23 and 26-32.

In the event that this paper is not being timely filed, the applicants respectfully petition for an appropriate extension of time. Please charge any fee or credit any overpayment pursuant to 37 §C.F.R. 1.16 or §1.17 to Deposit Account No. 02-2135.

Respectfully submitted,

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VIII.

APPENDIX OF CLAIMS ON APPEAL

1. A synergistic herbicidal mixture comprising

A) 4-[2-methyl-3-(4,5-dihydroisoxazol-3-yl)-4-methylsulfonyl-benzoyl]-1-methyl-5-hydroxy-1H-pyrazole

and

B) two herbicides selected from the group consisting of imazapyr, imazaquin, imazamethabenz-methyl, imazamox, imazapic and imazethapyr;

and,

C) a triazine selected from the group consisting of ametryn, atrazine, cyanazine, desmetryn, dimethamethryn, prometon, prometryn, propazine, simazine, simetryn, terbumeton, terbutryn, terbutylazine and trietazine

or their environmentally compatible salts;

in a synergistically effective amount.

Claims 2 - 7. (Canceled)

8. A synergistic herbicidal mixture as claimed in claim 1, comprising as component B) imazapyr and imazethapyr.

9. A synergistic herbicidal mixture as claimed in claim 1, comprising as component B) imazapic and imazapyr.

Claims 10 - 22. (Canceled)

23. A synergistic herbicidal mixture as claimed in claim 1 comprising, as component A) 4-[2-methyl-3-(4,5-dihydroisoxa-zol-3-yl)-4-methylsulfonyl-benzoyl]-1-methyl-5-hydroxy-1H-pyrazole, as component B) imazapyr and imazethapyr as component C) atrazine.

24. (Canceled)

25. (Canceled)

26. A synergistic herbicidal mixture as claimed in claim 1 comprising, as component A) 4-[2-methyl-3-(4,5-dihydroisoxa-zol-3-yl)-4-methylsulfonyl-benzoyl]-1-methyl-5-hydroxy-1H-pyrazole, as component B) imazapic and imazapyr as component C) atrazine.

27. Synergistic herbicidal mixture as claimed in claim 1, wherein component A) and B) are present in a weight ratio of 1:0.001 to 1:500.

28. Synergistic herbicidal mixture as claimed in claim 1 , wherein component A) and component C) are present in a weight ratio of 1:0.002 to 1:800.

29. A herbicidal composition comprising a herbicidally active amount of a synergistic herbicidal mixture as claimed in claim 1, at least one inert liquid and/or solid carrier and, if desired, at least one surfactant.

30. A process for the preparation of herbicidal compositions as claimed in claim 29, comprising mixing component A), component B), if desired, component C), at least one inert liquid and/or solid carrier and, if appropriate, a surfactant.

31. A method of controlling undesired vegetation, comprising applying simultaneously or separately to said vegetation, the environment of said vegetation and/or seeds of said vegetation

A) 4-[2-methyl-3-(4,5-dihydroisoxazol-3-yl)-4-methylsulfonyl-benzoyl]-1-methyl-5-hydroxy-1H-pyrazole;

and

B) two herbicides selected from the group consisting of imazapyr, imazaquin, imazamethabenz-methyl, imazamox, imazapic and imazethapyr;

and

C) a triazine selected from the group consisting of ametryn, atrazine, cyanazine, desmetryn, dimethamethryn, prometon, prometryn, propazine, simazine, simetryn, terbumeton, terbutryn, terbutylazine and trietazine

or their environmentally compatible salts;

in a synergistically effective amount.

32. The method of claim 31, wherein the undesired vegetation is proximate crop plants, and the application is to the leaves of the crop plant and of the undesired vegetation.

33. The synergistic herbicidal mixture according to claim 1, wherein said triazine is atrazine.

IX.

Evidence Appendix

NONE

X.

RELATED PROCEEDINGS APPENDIX

NONE